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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/707,616	04/06/2001	Eric Lee Lindemann	A02.134	8289

7590 04/23/2004

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EXAMINER	
GRAHAM, ANDREW R	

ART UNIT	PAPER NUMBER
2644	19

DATE MAILED: 04/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/707,616	Applicant(s) LINDEMANN ET AL.	
	Examiner Andrew Graham	Art Unit 2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 December 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10,14-20,24-34,38-44 and 48* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10,14-20,24-34,38-44 and 48* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 December 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *15,18*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Corrected drawings were received on December 18, 2003. The applicant's assistance in making the reference character changes is acknowledged and these drawings are approved, except for the minor informalities listed below.

- the reference character "130" in Figures 2B and 15B does not appear to be mentioned in the specification
- the reference character "1806" in Figure 19 does not appear to be mentioned in the specification

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The cancellation of claims previously rejected under 35 U.S.C. 112 is acknowledged and accordingly, said rejection is hereby withdrawn.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. **Claims 1-10, 14-20, 24-34, and 38-44** are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 5-13 of copending Application No. 09/452904. Although the conflicting claims are not identical, they are not patentably distinct from each other because the current claims are a subcombination of the claims from the previous application. The claims of the current application cite only the receiver and not the combination of the receiver and transmitter as in the audio system of the prior application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claims 1-8, 10, 14-18, 20, 24-30, 32, 34, 38-42, and 44** are rejected under 35 U.S.C. 103(a) as being anticipated by Schotz et al (USPN 5832024) in view of Allen et al (USPN 6487296 B1). Hereafter, "Schotz et al" will be simply referred to as "Schotz" and "Allen et al" will simply be referred to as "Allen".

Regarding **Claim 1**, Schotz discloses a digital wireless speaker system (20) with a transmitter (22) and a receiver (24) (col. 6, lines 6-11). The antenna (40) of the receiver (24) meets the limitation of "means for receiving the RF signal". The receiver system (24) includes a data clock recovery circuit (194) that obtains a clock signal from the input signal and further provides the rest of the system with a synchronized clock signal (col. 12, lines 28-36). This reads on "means for generating a derived sample clock based upon the transmission clock". The system also includes a convolutional deinterleaver (200) and an FEC decoder (198) for deriving the audio data from the input signal (col. 12, lines 47-67 and col. 13, lines 1-9). This data is then received by an output means (46), which connects the output signal to speakers or another suitable transducer equipment (col. 6, lines 51-54). This reads on "means for broadcasting sound based upon the selected audio channel".

However, Schotz does not specify:

- that the loudspeaker is a distributed digital wireless system with at least two discrete wireless speakers
- means in each speaker for selecting one of the audio output channels

Allen discloses a wireless surround sound speaker system that includes a variety of options regarding the output and controls of the various speakers of the system. Allen's system includes a transmitter (13) and multiple receivers (90,91,100,101), where a receiver (14) is incorporated at each speaker (30) (col. 5, lines 45-65). Such an arrangement, in view of the transmission of signals by Schotz, reads on "A distributed digital wireless loudspeaker system", and the speakers shown in Figure 1 read on "at least two discrete speakers". The transmitter (13) includes multiple transmitters (65,66,80,81) for emitting various channels of the audio input signal at pre-selected frequencies (51) (col. 7, lines 34-39 and 59-62). The capability of selecting one of these channels though the use of a channel selector knob (40) reads on "means for selecting one of the audio channels from the RF signal for broadcast" and the inherent processing of the channel data for output, such as by the decoders (92,102) and amplifier (110) of Allen, reads on "means for generating an output audio signal based upon the selected audio channel" (col. 7, lines 63-67 and col. 8, lines 1-19).

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to include the multiple independent speakers with respective, individual receivers as taught by Allen into the digital wireless system of Schotz. The motivation behind such a modification would have been the capability of selecting one of a plurality of channels to be emitted by a single speaker, as is disclosed by Allen. The connection of individual receivers in each of

the speakers would have been desirable because it would have eliminated the need for any wiring between speakers, as is noted by Allen. It would also enabled local controls to be placed at each individual speaker, as is shown in Allen (Figure 1).

Regarding **Claim 2**, the incoming broadcast signal (36) of Schotz is processed through the receiver (24) to decoder (198), which supplies error information on a status line (226) to the microprocessor (164) (col. 13, lines 45-48). The digital interface receiver (214) also receives information from the decoder (198) and demultiplexes the signal and decodes subcode information in the signal (col. 13, lines 32-39). This subcode contains information about the quality of the received digital audio as well as the control of aspects such as the volume or tone of the emitted signal. Collectively, this input data derived from the input signal reads on "the received RF signal includes status data".

Regarding **Claim 3**, the digital interface receiver (214) receives information from the decoder (198) and demultiplexes the signal and decodes subcode information in the signal (col. 13, lines 32-39). This subcode contains information concerning the control of aspects of the signal output such as the volume or tone of the emitted signal. On the transmitter side, the subcode information that the digital interface transmitter (62) has the ability to add to the transmission signal includes volume, tone, and other auxiliary control information (col. 8, lines 9-12). Between the volume controls and the most common types of auxiliary control information that a system such as this

would involve, the processing performed by the microprocessor (164) based on these control codes reads on "further comprising means responsive to a control signal in the status data for selectively activating the speaker".

Regarding **Claim 4**, the digital interface receiver (214) of Schotz receives information from the decoder (198) and demultiplexes the signal and decodes subcode information in the signal (col. 13, lines 32-39). This subcode contains information concerning the control of aspects of the signal output such as the volume or tone of the emitted signal. The microprocessor (164) determines the control codes that are used to adjust the volume and tone of the emitted signal (col. 13, lines 40-45). Schotz also discloses that the microprocessor may be used to perform signal processing on the digital audio data. The volume control reads on "means for responding to a control signal in the status data operable for controlling volume of the broadcast sound".

Regarding **Claim 5**, the digital interface receiver (214) of Schotz receives information from the decoder (198) and demultiplexes the signal and decodes subcode information in the signal (col. 13, lines 32-39). This subcode contains information concerning the control of aspects of the signal output such as the volume or tone of the emitted signal. The microprocessor (164) determines the control codes that are used to adjust the volume and tone of the emitted signal (col. 13, lines 40-45). Schotz also discloses that the microprocessor may be used to perform signal processing on the digital audio data. The tone

controls, taken in view of the teachings of individual speaker units of Allen, read on "means for responding to a control signal in the status data operable for controlling equalization of the broadcast sound".

Regarding **Claim 6**, The transmitter (13) OF Allen includes multiple transmitters (65,66,80,81) for emitting multiple channels of the audio input signal at selected frequencies (col. 7, lines 34-39 and 59-62). Allen specifically teaches that these frequencies are different, which reads on "means for receiving receives two RF signals at two different frequencies, each RF signal including one of the audio channels" (col. 10, lines 1-2).

Regarding **Claim 7**, the digital interface transmitter (62) combines the control subcodes, a synchronization signal, and the left and right audio data into the single, serial output bit stream (col. 8, lines 5-26). This combined signal is then transmitted from the receiver through transmitter antenna means (38). This reads on "the RF signal further includes a channel of status data".

Regarding **Claim 8**, the transmitter includes a digital interface transmitter that initially combines the left and right audio data with the synchronization signal and any control subcodes (col. 8, lines 8-26). The receiver includes a digital interface receiver (214) that demultiplexes the received transmission signal (col. 13, lines 31-33). These two components read on "the two channels of audio transmission data and the status channel are multiplexed prior to transmission" and "means for demultiplexing the received RF signal".

Regarding **Claim 10**, the serial output data from the digital interface transmitter is biphase-mark encoded (col. 8, lines 19-21). The encoding of the digital interface transmitter specifically includes a synchronization signal (col. 8, lines 21-26). As is well known in the art, biphase-mark encoding schemes involving data transmission include a particular sequence of data that signify the beginning or end of a frame of transmitted data. Schotz also teaches that synchronization is an essential and difficult aspect of high fidelity digital signal transmission because of the high, real-time rate of data transfer (col. 3, lines 20-65). Schotz also discloses that data timing must be synchronized with the transmitter, as does the data synchronization (col. 3, lines 42-48). As stated above, the system of Allen discloses the concept of including a receiver at multiple, individual speaker locations. In view of the required, real-time data timing and data synchronization between the transmitter and receiver in the single communication pair of Schotz, it is respectfully submitted that additional receivers would also each need to be synchronized with the transmitter in a real-time manner. This real-time manner would thus mean that the individual receivers would be mutually synchronized to the same audio source, and effectively, to each other. The motivation for such synchronizaton would be the avoidance of drop-outs or improper data timing, as noted in the teachings of Schotz. Accordingly, it is respectfully submitted that the teachings of Schotz, when taken in view of Allen, read on "the RF signal includes frame markers and the speaker further comprises means

responsive to the frame markers for synchronizing the sound broadcast by the speaker with the sound broadcast by each other speaker".

Regarding **Claim 14**, please refer to the like teachings of Claim 1. Regarding **Claim 15**, please refer to the like teachings of Claim 2. Regarding **Claim 16**, please refer to the like teachings of Claim 3. Regarding **Claim 17**, please refer to the like teachings of Claim 4. Regarding **Claim 18**, please refer to the like teachings of Claim 5. Regarding **Claim 20**, please refer to the like teachings of Claim 10. Regarding **Claim 24**, please refer to the like teachings of Claims 1 and 10. Regarding **Claim 25**, please refer to the like teachings of Claim 2. Regarding **Claim 26**, please refer to the like teachings of Claim 3. Regarding **Claim 27**, please refer to the like teachings of Claim 4. Regarding **Claim 28**, please refer to the like teachings of Claim 5. Regarding **Claim 29**, please refer to the like teachings of Claim 6. Regarding **Claim 30**, please refer to the like teachings of Claims 7 and 8. Regarding **Claim 32**, please refer to the like teachings of Claims 1 and 2. Regarding **Claim 34**, please refer to the like teachings of Claim 10. Regarding **Claim 38**, please refer to the like teachings of Claims 1 and 8. Regarding **Claim 39**, please refer to the like teachings of Claim 2. Regarding **Claim 40**, please refer to the like teachings of Claim 3. Regarding **Claim 41**, please refer to the like teachings of Claim 4. Regarding **Claim 42**, please refer to the like teachings of Claim 5. Regarding **Claim 44**, please refer to the like teachings of Claim 10.

teachings of Claim 5. Regarding **Claim 44**, please refer to the like teachings of Claim 10.

5. **Claims 9, 19, 31, 33, and 43** are rejected under 35 U.S.C. 103(a) as being unpatentable over Schotz in view of Allen as applied above, and further in view of Anderson et al (USPN 5406634). Hereafter, "Anderson et al" will simply be referred to as "Anderson".

As detailed above, Schotz discloses a wireless digital loudspeaker system that transmits a single, serial data stream between an input signal transmitter and multiple output receivers. This information included in this transmitted data stream involves control data for adjusting the output operations of the receiving speakers of the system (col. 8, lines 5-26). As detailed above, the microprocessor (164) of the receiver (24) is used to read the control codes, which is in turn used to control the receiver controls, such as those that relate to volume and tone (col. 13, lines 42-44). Allen discloses the use of individual receivers at each individual speaker means, wherein the receiver obtains multiple transmitted frequencies.

Yet, Schotz does not specify:

- that the system includes means for assigning the speaker to a speaker group
- corresponding means for selectively activating the speaker based on this speaker group

Anderson discloses an intelligent speaker unit that provides both a speaker as well as the transmission unit of the system with a wider

also includes the ability to assign multiple speakers with the same sound delay value, based on the location of the speakers (col. 6, lines 21-29). In both situations, these associations and variables are used to determine the output of the speakers. This, in view of the components involved with the control codes in Schotz, reads on "means responsive to a control signal in the status data for assigning the speaker to a speaker group for selectively activating the speaker based on the speaker group to which the speaker is assigned".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to add the extended control capabilities of Anderson to the system of Schotz. Such a control message system would have provided an additional manner for using the various individual loudspeakers in the combined system of Schotz in view of Allen may be used. This additional use would have increased the complexity and selectivity available for such an overall, combined audio system. Such controls would have also been based on a property of the sound emission arrangement other than the volume or tone of the signal being emitted.

Regarding **Claim 19**, please refer to the like teachings of Claim 9. Regarding **Claim 31**, please refer to the like teachings of Claim 9. Regarding **Claim 33**, please refer to the like teachings of Claim 9. Regarding **Claim 43**, please refer to the like teachings of Claim 9.

5. **Claim 48** is rejected under 35 U.S.C. 103(a) as being unpatentable over Schotz in view of Allen as applied above, and further in view of

6. **Claim 48** is rejected under 35 U.S.C. 103(a) as being unpatentable over Schotz in view of Allen as applied above, and further in view of Proakis ("Digital Communications", 3rd Ed. MacGraw-Hill, 1995. pages 698-702). Hereafter, this latter reference will simply be referred to as "Proakis".

As detailed above, Schotz discloses a wireless digital loudspeaker system that transmits a single, serial data stream between an input signal transmitter and multiple output receivers. Allen discloses a method for utilizing individual receivers at each speaker to enable an output channel to be selected for the respective speakers. Schotz discloses that the rate of the DSSS transmitter is approximately 16 times the audio bit rate, based on an audio rate of approximately 1.4 Mbps and an operating frequency of 22.5792. It is noted that the audio sample rate is given as an approximation, and several numbers such as 1.50528 and 1.32819 which are approximate to 1.4 would have give the respective output integer multiples of 15 and 17, which are also approximate to the integer 16. It is also noted that the given audio bit rate has only one significant bit. Within the described approximation, the exact audio sample rate of 1.4112, which is approximate to 1.4, would have given the exact audio to output clock ratio of 16. While these approximations significantly suggest the possibility of an integer relationship between the chip clock and the audio data rate, Schotz in view of Allen does not specify:

- that the chip clock has a rate equal to an integer multiple of a rate of the audio sample clock

Proakis discloses the definition of direct sequence spread spectrum signal, including the definition of a chip and the bandwidth expansion factor of using two different rates of the input audio bits and the encoder output bits. Proakis specifically teaches that the expansion factor, the ratio of the output bit, or chip, rate versus the input bit rate is an integer. This teaching reads on "means for obtaining a direct sequence spread spectrum chip clock having a rate equal to an integer multiple of a rate of the audio sample clock".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to make the DSSS of the system of Schotz in view of Allen operate at an integer multiple ratio, as is taught by Proakis. The motivation behind such a modification would have been that such an integer multiple ratio would have made the operation of the DSSS transmitter practical, as is noted by Proakis.

Response to Arguments

7. Applicant's arguments filed December 18, 2003 have been fully considered but they are not persuasive.

On page 36, line 1, the applicant has stated, "By contrast, the speakers of Schotz are wired to a central receiver". The respectfully notes that the speakers of Allen, as is now incorporated in the above rejection, are not wired to a central receiver, but rather, each have individual receiver units.

receivers output data that is synchronized with the transmitter in order to achieve a high fidelity recreation of the intended audio field. Thus, in view of the amended rejection, it would have been obvious to include re-synchronization capabilities in each speaker, thereby synchronizing each speaker with the central transmitter and thus to each other.

On page 36, lines 17-18, the applicant has stated, "By contrast, the chip clock of Schotz is only 'approximately 16 times the digital audio bit rate'". However, it is noted this is a new limitation introduced by amendment in Claim 48, and has been addressed in the new rejection accordingly.

On page 40, lines 8-9, the applicant has stated, "By contrast, the system of Allen includes multiple, independent receivers in each speaker". The examiner respectfully notes the difference between this statement and the relative claim language. The claim language of Claim 1 and similar claims only recites "means for receiving". This claim language is broad enough in scope such that multiple receivers, such as those shown in Allen, may be considered "receiving means". It is respectfully submitted that narrowing the scope of the language of this claim may provide distinction from the prior art of record, though such an amendment would require further search and consideration before a determination of allowability could be given.

though such an amendment would require further search and consideration before a determination of allowability could be given.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Graham whose telephone number is 703-308-6729. The examiner can normally be reached on Monday-Friday, 8:30 AM to 5:00 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Isen can be reached on (703)305-4386.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AG

Andrew Graham

Examiner
A.U. 2644

ag
April 18, 2004

MINSUN OH HARVEY
PRIMARY EXAMINER